

REMARKS

The Office Action dated September 8, 2004, has been received and reviewed.

Claims 1-29 are currently pending and under consideration in the above-referenced application. Each of claims 1-29 stands rejected.

Reconsideration of the above-referenced application is respectfully requested.

Supplemental Information Disclosure Statement

A copy of the Supplemental Information Disclosure Statement filed January 9, 2004, is enclosed and resubmitted, along with the Miller and Webpage documents. It is respectfully requested these references be considered and made of record in the above-referenced application and that an initialed copy of the Form PTO/SB/08A that accompanies this Supplemental Information Disclosure Statement be returned to the undersigned attorney as evidence of such consideration.

Rejections Under 35 U.S.C. § 102

Claims 1-12 and 15-29 stand rejected under 35 U.S.C. § 102.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Steffen

Claims 1-4, 9-11, and 15-21 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter which is purportedly anticipated by that described in U.S. Patent 5,041,395 to Steffen (hereinafter "Steffen").

Steffen describes a substrate that includes a metal grid 10 (evidently a lead frame) and a plastic strip 20 overlying parts of the metal grid 10, presumably to hold separate parts of the metal grid 10 together while maintaining an electrically isolated relationship between different parts of the grid 10. *See, e.g.*, FIGs. 4-6; col. 3, lines 62-68 (which explains that different zones

of the grid 10 are separate from one another); col. 4, lines 1-58 (which explains that the plastic strip 20 overlaps interstices 16 in the grid 10). Perforations 24 in the plastic strip 20 facilitate the formation of electrical connections (*e.g.*, bond wires 28) between a semiconductor device 26 positioned on the substrate and the metal grid 10. *See, e.g.*, FIGs. 4-6; col. 4, lines 6-7, 61-65.

Independent claim 1 is directed to a method for forming a semiconductor device assembly. The method of independent claim 1 includes, among other things, providing a solder mask. The solder mask that is provided in accordance with the requirements of independent claim 1, as amended and presented herein, includes a device-securing region, which is positioned over at least partially over a die-attach location of a carrier substrate.

The plastic film 20 of Steffen does not include a device-securing region. Rather, it includes a central hole 22 through which a central zone 12 of the grid is exposed so that a semiconductor device 26 may be secured directly to the grid. Therefore, Steffen does not expressly or inherently describe providing a solder mask in the manner required by amended independent claim 1.

Therefore, under 35 U.S.C. § 102(b), the subject matter to which amended independent claim 1 is directed is allowable over the subject matter described in Steffen.

Claims 2-4 and 9-11 are each allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 9 is additionally allowable since Steffen neither expressly nor inherently describes “providing a solder mask with . . . at least one dam comprising a laterally extending portion configured to cover at least a portion of a peripheral edge of a connection surface of . . . at least one terminal” of a carrier substrate.

Independent claim 15 recites a method for designing a solder mask for use on a carrier substrate. The method of independent claim 15 includes “configuring at least one device-securing region to have a semiconductor device secured thereto . . .” Additionally, as amended and presented herein, independent claim 15 recites “configuring a plurality of raised dams, each to be positioned adjacent to and in contact with a periphery of a single, corresponding terminal of the carrier substrate.”

Steffen does not expressly or inherently describe each and every element of amended independent claim 15. In particular, Steffen lacks any express or inherent description of a method that includes “configuring a device-securing region” of a solder mask “to have a semiconductor device secured thereto . . .” Instead, the description of Steffen is limited to providing a plastic strip 20 that includes a central hole 22, within which a semiconductor device 26 may be positioned so that the semiconductor device 26 may then be secured to an underlying substrate (*i.e.*, central zone 12 of grid 10).

Accordingly, Steffen does not anticipate each and every element of amended independent claim 15, as would be required to maintain the 35 U.S.C. § 102(b) rejection.

Claim 16 is allowable, among other reasons, for depending from claim 15, which is allowable.

Independent claim 17 is also drawn to a method for designing a solder mask. The method of independent claim 17 includes, among other things, “configuring at least one device-securing region to have a semiconductor device secured thereto.”

Again, Steffen includes no express or inherent description of configuring the plastic strip 20 described therein to include a device-securing region to which a semiconductor device may be secured.

Therefore, Steffen does not anticipate each and every element of independent claim 17, as would be required to maintain the 35 U.S.C. § 102(b) rejection of independent claim 17.

Claim 18 is allowable, among other reasons, for depending from claim 17, which is allowable.

Independent claim 19 recites a method for designing a solder mask that includes, among other things, “configuring at least one device-securing region . . . to be located over at least a portion of a die-attach location of [a] carrier substrate.”

In Steffen, the plastic strip 20 includes a central hole 22 which is configured to be positioned over a central zone 12 of a grid 10. Thus, when the plastic strip 20 is positioned over the grid 10, there is nothing over the central zone 12. As such, Steffen does not anticipate a

method for designing a solder mask that includes “configuring at least one device-securing region . . . to be located over at least a portion of a die-attach location of [a] carrier substrate.”

Therefore, under 35 U.S.C. § 102(b), amended independent claim 19 recites subject matter which is allowable over that described in Steffen.

Claim 20 is allowable, among other reasons, for depending from claim 19, which is allowable and, further, because Steffen does not expressly or inherently describe configuring a dam that includes a laterally extending ledge positionable over at least a portion of a peripheral edge of a connection surface of a terminal of a carrier substrate.

Fontecha

Claims 1-8, 10, 12, 15-19, and 22-28 stand rejected under 35 U.S.C. § 102(e) for reciting subject matter which is purportedly anticipated by that described in U.S. Patent 6,448,507 to Fontecha et al. (hereinafter “Fontecha”).

Fontecha describes a solder mask 14 of uniform thickness. FIG. 2. The solder mask 14 of Fontecha includes a trough 15 positionable between bond fingers 13 of a substrate 10 and a location where a semiconductor device 11 is to be positioned over the solder mask 14. FIGs. 1 and 2; col. 3, lines 40-55. The trough 15 is configured to prevent adhesive material from bleeding onto the bond fingers. Col. 3, lines 52-55.

Independent claim 1 is directed to a method for forming a semiconductor device assembly. The method of independent claim 1 includes, among other things, providing a solder mask. The solder mask that is provided in accordance with the requirements of independent claim 1, as amended and presented herein, includes at least one dam that protrudes to an elevation that exceeds an elevation of a device-securing region of the solder mask.

As the solder mask 14 of Fontecha has a uniform thickness, it does not include a dam that protrudes to a greater elevation than the elevation to which the region of the solder mask 14 to which a semiconductor device 11 is to be secured protrudes. Therefore, Fontecha does not expressly or inherently describe, or anticipate, each and every element of amended independent claim 1.

Accordingly, under 35 U.S.C. § 102(e), amended independent claim 1 recites subject matter which is allowable over that described in Fontecha.

Each of claims 2-8, 10, and 12 is allowable, among other reasons, for depending directly or indirectly from claim 1, which is allowable.

Independent claim 15 recites a method for designing a solder mask for use on a carrier substrate. The method of independent claim 15 includes “configuring at least one device-securing region to have a semiconductor device secured thereto . . .” Additionally, as amended and presented herein, independent claim 15 recites “configuring a plurality of raised dams, each to be positioned adjacent to and in contact with a periphery of a single, corresponding terminal of the carrier substrate.”

Fontecha neither expressly nor inherently describes “configuring a plurality of raised dams” of a solder mask, “each to be positioned adjacent to and in contact with a periphery of a single, corresponding terminal of [a] carrier substrate.” Instead, as FIG. 1 of Fontecha clearly illustrates, a plurality of bond fingers 13 of a substrate 10 are exposed through a single opening in the solder mask 14 and, thus, collectively surrounded by the walls of that opening.

Therefore, Fontecha does not anticipate each and every element of amended independent claim 15, as would be required to maintain a 35 U.S.C. § 102(e) rejection against amended independent claim 15.

Claim 16 is allowable, among other reasons, for depending from claim 15, which is allowable.

Independent claim 17 is also drawn to a method for designing a solder mask. The method of independent claim 17, as amended and presented herein, includes, among other things, “configuring at least one recessed area adjacent to and surrounding . . . at least one device-securing region.”

Fontecha includes no express or inherent description of configuring the solder mask 14 thereof with at least one recessed area that surrounds the region to which a semiconductor device 11 is to be secured. Rather, as FIG. 1 of Fontecha clearly illustrates, a trough 15 of the

solder mask 14 is merely configured to be positioned adjacent one edge of the region to which a semiconductor device 11 is to be secured.

Therefore, Fontecha does not anticipate each and every element of amended independent claim 17, as would be required to maintain a 35 U.S.C. § 102(e) rejection based on Fontecha against amended independent claim 17.

Claim 18 is allowable, among other reasons, for depending from claim 17, which is allowable. Claim 18 is additionally allowable since Fontecha lacks any express or inherent description of configuring a plurality of raised dams.

Independent claim 19 recites a method for designing a solder mask that includes, among other things, “configuring at least one dam . . . to have a height that exceeds a height of . . . at least one device-securing region” of the solder mask.

The solder mask 14 of Fontecha has a uniform thickness. Thus, it does not include a dam that has a height that exceeds the height of a region to which a semiconductor device 11 is to be secured.

Therefore, under 35 U.S.C. § 102(e), amended independent claim 19 recites subject matter which is allowable over that described in Fontecha.

Claim 22 is allowable, among other reasons, for depending from claim 19, which is allowable.

Independent claim 23 recites a method for designing a carrier substrate. The method of independent claim 23 includes “configuring at least one terminal . . . to protrude a sufficient distance from [a] substantially planar substrate to prevent excess adhesive material forced from between a semiconductor device and . . . at least one die-attach location from contaminating a connection surface of the at least one terminal.”

In Fontecha, a region of the solder mask 14 located between the trough 15 and the opening through which the bond fingers 13 of substrate 10 are exposed is needed to prevent adhesive from bleeding onto the bond fingers 13. Fontecha includes no express or inherent description that the height of a bond fingers 13 may be configured to further contribute to

preventing adhesive material from contaminating the connection surface of the bond finger.

Therefore, Fontecha does not anticipate each and every element of independent claim 23.

As such, it is respectfully submitted that, under 35 U.S.C. § 102(e), independent claim 23 recites subject matter which is allowable over that disclosed in Fontecha.

Claims 24-28 are each allowable, among other reasons, for depending either directly or indirectly from claim 23, which is allowable.

Claim 24 is additionally allowable because Fontecha does not expressly or inherently describe configuring a substrate to include an adhesive-receiving area.

Claim 25, which depends from claim 24, is also allowable since Fontecha lacks any express or inherent description of configuring a substrate to include at least one recess.

Claim 26 depends from claim 25 and is further allowable because Fontecha does not expressly or inherently describe a method for designing a substrate that includes configuring a recess that “substantially laterally surround[s] . . . at least one die-attach location” of the substrate.

Claim 27 also depends from claim 25, and is additionally allowable because Fontech lacks any express or inherent description of configuring a recess of a substrate to be located adjacent to only a portion of a die-attach location of the substrate.

Bhatt

Claims 23 and 29 stand rejected under 35 U.S.C. § 102(e) for reciting subject matter which is allegedly anticipated by the subject matter described in U.S. Patent 6,426,565 to Bhatt et al. (hereinafter “Bhatt”).

Bhatt describes a substrate 12 that includes a recess 16 for receiving a semiconductor device 34 and placing an active surface of the semiconductor device 34 at about the same elevation as a corresponding surface 14 of the substrate 12. FIG 1. Another recess 22 is located within recess 16, surrounding a pedestal 28 upon which the semiconductor device 34 is to be positioned. *Id.* Recess 22 is configured to receive excess adhesive 35. Col. 5, lines 37-39.

Independent claim 23, as amended and presented herein, recites a method for designing a carrier substrate, including “configuring a substantially planar substrate to include at least one die attach-location on a major surface thereof.”

As the pedestal of 28 of the substrate 14 of Bhatt is not on a major surface thereof but, rather, within a recess 16 and, thus, recessed beneath the surface 14 of the substrate 12, it is respectfully submitted that Bhatt does not expressly or inherent describe, or anticipate, each and every element of amended independent claim 23.

Therefore, under 35 U.S.C. § 102(e), amended independent claim 23 recites subject matter which is allowable over that described in Bhatt.

Claim 29 is allowable, among other reasons, for depending from claim 23, which is allowable.

For these reasons, withdrawal of the 35 U.S.C. § 102(e) rejections of claims 1-12 and 15-29 is respectfully solicited.

Rejections Under 35 U.S.C. § 103(a)

Claims 13 and 14 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over that taught in Fontecha.

Claims 13 and 14 are allowable, among other reasons, for depending indirectly from claim 1, which is allowable.

CONCLUSION

It is respectfully submitted that each of claims 1-29 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Brick G. Power", written in a cursive style.

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